

CLAIMS

What is claimed is:

1. A method for operation of an air-suspension system for a vehicle, the air-suspension system including a compressed-air delivery device, a plurality of air-suspension bellows and valves constructed and arranged for controlling the filling of one of one, several and all of the air-suspension bellows with compressed air from the compressed-air delivery device, the arrangement of the valves defining a plurality of states, the method comprising the step of automatically controlling the effective delivery capacity of said compressed-air delivery device as a function of a state of the plurality of states defined by the arrangement of said valves.

2. The method of claim 1, wherein said step of automatically controlling the effective delivery capacity of said compressed-air delivery device includes controlling at least one of speed and rpm of said compressed-air delivery device.

3. The method of claim 1, wherein said air-suspension system further includes at least one vent port, and said step of automatically controlling the effective delivery capacity of said compressed-air delivery device includes venting compressed air via said at least one vent port to atmosphere.

4. The method of claim 3, wherein said vent port includes an electronically actuatable vent valve for venting compressed air to atmosphere.

5. The method of claim 1, wherein said air-suspension system further includes at least one air-intake device, and said step of automatically controlling the effective delivery capacity of said compressed-air delivery device includes sucking in air from atmosphere via said air-intake device.

6. The method of claim 5, wherein said air-intake device is electronically actuatable and includes an intake valve for sucking air in from atmosphere.

7. The method of claim 1, wherein said compressed-air delivery device includes an intake side and an outlet side, and further including a bypass valve through which a bypass flow of compressed air can travel from said outlet side to said intake side while circumventing at least a portion of the arrangement of said valves, said step of controlling the effective delivery capacity of said compressed-air delivery device being effected between said intake side and said outlet side using said bypass valve.

8. The method of claim 7, wherein said bypass valve is an electrically actuatable solenoid valve.

9. The method of claim 7, wherein said bypass valve is one of an overflow valve and a pressure-limiting valve.

10. The method of claim 1, wherein said air-suspension system has a normal delivery capacity mode of operation and a reduced delivery capacity mode of operation, and further comprising the step of activating at least one of said normal delivery capacity mode of operation and said reduced delivery capacity mode of operation during automatic control of the effective delivery capacity of said compressed-air delivery device, the effective delivery capacity of said compressed-air delivery device being smaller in said reduced delivery capacity mode of operation than in said normal delivery capacity mode of operation.

11. The method of claim 10, wherein said air-suspension system includes four air suspension bellows, and further comprising the step of delivering compressed air by said compressed-air delivery device according to one of (i) said normal delivery capacity mode of operation to at least three of said four air-suspension bellows, and (ii) said reduced delivery capacity mode of operation.

12. The method of claim 10, wherein said compressed-air delivery device has an intake side and an outlet side, and said reduced delivery capacity mode of operation is effected when the pressure on said outlet side of said compressed-air delivery device exceeds a predefined pressure value.

13. The method of claim 10, wherein said compressed-air delivery device is driven by rotary movement, and said reduced delivery capacity mode of operation is effected when a drive rpm of said compressed-air delivery device falls below a predefined rpm value.

14. The method of claim 10, wherein said compressed-air delivery device is driven by an electric motor, and said reduced delivery capacity mode of operation is effected when current drawn by said electric motor exceeds a predefined current value.

15. An air-suspension system for a vehicle, comprising a compressed-air delivery device, a plurality of air-suspension bellows, valves constructed and arranged for controlling the filling of at least one of the air-suspension bellows with compressed air from the compressed-air delivery device, the arrangement of the valves defining a plurality of states, and means for automatically controlling the effective delivery capacity of said compressed-air delivery device as a function of a state of the plurality of states defined by the arrangement of said valves.

16. The air-suspension system of claim 15, wherein said means for automatically controlling the effective delivery capacity of said compressed-air delivery device includes means for controlling at least one of speed and rpm of said compressed-air delivery device.

17. The air-suspension system of claim 15, further comprising at least one vent port for controlling the effective delivery capacity of said compressed-air delivery device by venting compressed air to atmosphere.

18. The air-suspension system of claim 17, wherein said vent port includes an electronically actuatable vent valve for venting compressed air to atmosphere.

19. The air-suspension system of claim 15, further comprising at least one air-intake device for controlling the effective delivery capacity of said compressed-air delivery device by sucking in air from atmosphere.

20. The air-suspension system of claim 19, wherein said air-intake device is electronically actuatable and includes an intake valve for sucking air in from atmosphere.

21. The air-suspension system of claim 15, wherein said compressed-air delivery device includes an intake side and an outlet side, and further comprising a bypass valve for controlling the effective delivery capacity of said compressed-air delivery device arrangement between said intake side and said outlet side through which a bypass flow of compressed air can travel from said outlet side to said intake side while circumventing at least a portion of the arrangement of said valves.

22. The air-suspension system of claim 21, wherein said bypass valve is an electrically actuatable solenoid valve.

23. The air-suspension system of claim 21, wherein said bypass valve is one of an overflow valve and a pressure-limiting valve.

24. The air-suspension system of claim 15, further comprising operation mode control means for activating at least one of a normal delivery capacity mode of operation and a reduced delivery capacity mode of operation during automatic control of the effective delivery capacity of said compressed-air delivery device, the effective delivery capacity of said compressed-air delivery device being smaller in said reduced delivery capacity mode of operation than in said normal delivery capacity mode of operation.

25. The air-suspension system of claim 24, further comprising four air suspension bellows, and means for delivering compressed air by said compressed-air delivery device according to one of (i) said normal delivery capacity mode of operation to at least three of said four air-suspension bellows, and (ii) said reduced delivery capacity mode of operation.

26. The air-suspension system of claim 24, wherein said compressed-air delivery device has an intake side and an outlet side, and said operation mode control means effects said reduced delivery capacity mode of operation when the pressure on said outlet side of said compressed-air delivery device exceeds a predefined pressure value.

27. The air-suspension system of claim 24, wherein said compressed-air delivery device is driven by rotary movement, and said operation mode control means effects said reduced delivery capacity mode of operation when a drive rpm of said compressed-air delivery device falls below a predefined rpm value.

28. The air-suspension system of claim 24, wherein said compressed-air delivery device is driven by an electric motor, and said operation mode control means effects said reduced delivery capacity mode of operation when current drawn by said electric motor exceeds a predefined current value.